Laboratory Directed Research and Development Program FY 2012

Lead-PI	Title	Allocation ($K)
Abergel	Global Transcriptome, Deletome and Proteome Profiling of Yeast Exposed to Radioactive Metal Ions: a Tool to Distinguish Radiation-Induced Damage From Chemical-Toxicity.	227
Adams	Direct Determination of Electrostatic Interactions Through Advanced Analysis of High Resolution Macromolecular Crystal Data	99
Agarwal	Enabling High Performance Computing (HPC) Workflows on Clouds	151
Balsara	Spectroscopy and Microscopy Near Electrified Interfaces	275
Bebek	Fiber System Development for Surveys of Baryon Acoustic Oscillations (BAO) Applicable to the Future BigBOSS Experiment.	178
Belkacem et al	Scientific Tools in Multi-Dimensional X-ray Spectroscopy and Coherent Diffractive Imaging	332
Benedetti	Novel Laser-plasma Storage Ring for Synchrotron Radiation and Particle Physics Applications	150
Bokor	Ultrafast Spin and Magnetization Dynamics in Nanoscale Magnetic Structures	158
Bouskill	Developing a Mechanistic High-Latitude Soil Carbon and Nitrogen cycle Model in TOUGHREACT	135
Canon	Defining an Ecosystem to Support Data -Intensive Science	302
Chakraborty	High-throughput Isolation and Functional Screening (HIFS) of Microbes Relevant to Today's Carbon Cycling and Bioenergy Needs	107
Commer et al	Enhanced Subsurface Fluid Characterization Using Joint Hydrological and Geophysical Data Inversion	151
Davis	Effect of Secondary Mineral Coatings on Biogeochemical Processes	266
Deutsch	Highly Parallelized Synthesis of Microbial Genes Using Oligonucleotide Arrays	136
*Doeff	Low Cost Aqueous Sodium Ion Cells for Grid Applications	175
Fischer	Toward a US Greenhouse Gas Information System (GHGIS)	178
Fletcher et al	Assembly and Function of Organelles for Carbon Fixation	133
Francis, Fischer	Template Assisted Assembly of Monodisperse Discotic Phases as Highly Tunable Electronic Materials	139
Freedman et al	Bolometric Detectors for the Neutrinoless Double-Beta Decay Experiments	170
Garcia Martin et al	Metafluxomics of a Phosphorus Removing Microbial Community	115
Gilles	Photo-switchable Metal Organic Frameworks for CO2 Sequestration	176
Guo	Soft X-Ray Spectroscopy for In-situ Electronic Structure Study of Artificial Photosynthesis	136
Hadley	Measuring Vertical Profiles of Atmospheric Pollutants using High Altitude Meteorological Balloons	140
Haranczyk	An Optimization-based Strategy for Computational Design of Nanoporous Carbon-Zero Materials	154
Hartwig	Elementary Organometallic Reactions in a Protein Matrix	206
Haxton	The End Station: Developing New Nuclear and Computer Science Techniques for Hot and Dense Matter and Astrophysical Explosions	345
Hexemer et al	Long-range Ordering of Block Copolymers on Patterned Silicon	136
Hillson	Principles of Context-Controlled Standardized Biological Parts for Predictable and Rapid Assembly of New Biological Function	336
Jansson,C	CYANOALKANES: Engineering Cyanobacteria for Phototrophic Production of Jet Fuel	225
Kaindl et al	Attosecond XUV Condensed-Matter Science: Electronic Wavefunction Coherence and Correlated Dynamics	179

Seidl et al	Ion Beam Driven Fusion and Fusion-Fission Hybrids	106
Selkowitz	Dynamic Light Redirection by Optical Metamaterial Coatings	356
Sethian	Interlinkage of Cross-Disciplinary Mathematical Technologies	360
Shuh	Developing f-electron Soft X-ray Spectroscopy Simulation, Theory, and Experiment for Clean Energy Materials	359
Tainer	Enabling Structural Systems Biology at NGLS	409
Tokunaga	Testing a New Soil Carbon Sequestration Strategy by Accelerating Calcite Precipitation in Soils	221
Torn et al	Biological Carbon Sequestration: Fundamental Research on Biological Carbon Capture and Soil Carbon Stabilization	410
Toste	A Multi-Investigator Approach Towards Chemoenzymatic Catalysis	221
Tyliszczak et al	Ambient Pressure Photoemission Spectromicroscopy	151
Ushizima	Quantitative Image Analysis for Computational Modeling	145
van Tilborg	Experimental Realization of a High-Harmonics-Seeded, Laser-Plasma-Accelerator Driven Free-Electron Laser	311
Visel	Transcriptome Analysis of Agave, a Candidate Biofuel Feedstock for Semi-Arid Climates	143
von der Lippe	High Voltage Up- and Down-converters for Low Power Low Density Detector Instrumentation	174
Wang, Cheng	Grazing Incident Soft X-ray Scattering for Organic Photovoltaics	134
*Wang, Daojing	Multinozzle Arrays for Single Cell Metabolomics	174
Wang, Zhon	Combining Machine Learning and High Performance Computing to Discover Novel Enzymes	191
Warwick	Test Monochromator-Spectrometer Systems with Prototype High Density Gratings for High Resolution X-Ray Scattering	219
*Wilson	Oxidative Transformations of Organic Aerosol	165
Yablonovitch	Electrically Created Fuels	139
Yang, Chao	Computational Algorithms and Mathematical Software Tools for Material Science and Chemistry	186
Yang, Chao/ Marchesini	Computational Techniques for Non-crystalline Diffraction Imaging	146
Yang, Wanli	Soft X-ray Spectroscopy of Lithium-ions and Electrons for Li-ion Batteries	180
*Zhang, Yuegang	Surface-Selective Synthesis of Graphene Nanoribbons on Nanowire Templates	175
Zheng, Haimei	Development of Environmental Cell with Local Temperature Control	236
Zhou, Quanlin	Collaboration with China on Geologic Carbon Sequestration: Novel Field Tests to Characterize Heterogeneity for Chinas First Pilot Test	145
Zwart et al	Development and Feasibility of Fluctuation X-ray Scattering at the NGLS	301
	Total	18,678

*Track 2 Discovery Review projects